



GREENMARKET'S

# GRAINS

## GUIDE

*Printed for Greenmarket's Regional Grains Project*



**FOR THE LAST THREE YEARS**, *Greenmarket has been working to facilitate connections between grain growers, seed savers, millers, bakers, and brewers to help re-establish grain production in the northeast. Now, Greenmarket chefs and customers are driving the push to grow new (and old) varieties of wheat and grain, rebuild infrastructure and distribution networks, and create a dialogue between customers and producers around taste and flavor. Through this dialogue, we are seeing the co-creation and renewal of grains in our region, and there is more to come in the years ahead.*

*We hope you enjoy discovering the diversity, flavor, and depth of local grains that our Greenmarket farmers bring to the city each week.*

## WHAT YOU NEED TO KNOW ABOUT BUYING FRESH FLOUR

The freshly ground flour that is available at Greenmarket is “unrefined,” meaning the germ and bran have not been removed. The flour has not been bleached and there is no need to enrich it by adding nutrients because the nutrients of the grain are still intact. Fresh flour contains up to 98% of the whole grain, including the germ and the bran. Freshly ground, unrefined grains provide the full compliment of vitamins, minerals, soluble and insoluble fiber, antioxidants and, much to our delight, real flavor!

Fresh unrefined flour from the market is therefore highly perishable, as the germ and the bran are vulnerable to oxidation and will eventually turn rancid, giving the flour a much shorter shelf life than commercial flour. However, the trade off in flavor and nutritional value is more than worth the effort it takes to store and handle fresh grain.

It is highly recommended that you store your fresh flour in cool conditions and use it within two months of the milling date.

# WHEAT

Of all the grains, wheat is the most complicated. The baker must know the many components of its structure to understand what he or she is working with, and how to achieve the desired results.

## HARD AND SOFT WHEAT

The most important thing to know about wheat flour is whether it is hard or soft—this distinction will determine how one can bake with it.

### HARD WHEAT

Hard wheat is best for baking bread as it has a higher protein content (11-15%) and will make more gluten. Gluten is the protein found in wheat and related species. It helps dough rise and keep its shape by giving it elasticity. Hard wheat is also commonly referred to as “bread flour.”

### SOFT WHEAT

Soft wheat is best for making cakes, pastries, flat breads, and crackers, as it has a lower protein content (5-9%). Soft wheat is commonly referred to as “pastry flour.”

## ALL-PURPOSE FLOUR

All-purpose flour is a blend of hard and soft wheat. Generally it is composed of 25% hard wheat and 75% soft wheat, resulting in flour with an overall protein content of 9-11%.

All-purpose flour is blended so that it can be used for many purposes, including biscuits, cakes, breads, muffins, pastry and pasta.

## WINTER WHEAT

Winter wheat is planted in the fall and harvested in the summer. Winter wheat is slightly lower in protein than spring wheat, but higher in minerals. Winter wheat is best for yeasted bread, or it can be blended with soft spring wheat to make all-purpose flour.



## **SPRING WHEAT**

Spring wheat is planted in the spring, harvested in the summer, and produces the highest protein content of any wheat. Spring wheat is ground to make bread flour.

## **RED WHEAT**

Red wheat has a red pigment from tannins that give the bran (and flour) a slightly bitter flavor. Red wheat tastes slightly more astringent than white because red wheat has a higher content of phenolics and browning enzymes. Red has a more robust flavor, while white wheat is slightly milder. Red wheat is preferred for baking artisan breads.

## **WHITE WHEAT**

White wheat does not contain tannins, but has subtle flavor characteristics.

## **SIFTING**

Part of the milling or processing of grains includes sifting. How much bran is sifted out of the flour will impact the final product: how it can be used, how it will taste, and its nutritional content. Whole wheat flour has very little of the bran sifted out, while a “half-white” flour will have some of the bran removed.

## **HERITAGE WHEAT**

There are about 200,000 varieties of wheat the world over, with only a few genetic lines of wheat feeding the world today. A “heritage” wheat is defined as a variety that was introduced in North America before the 1960’s. There are both heritage (Red Fife, Marquis) and modern (Glen, AC Berrie, Warthog) wheat varieties being trialed and grown in the Northeast.

use **WHEAT** in

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Breads, Pastries &  
Cakes, Pasta, Alcohol



# TRITICALE

Triticale is a hybrid of wheat and rye. As a rule, triticale combines the high yield potential and grain quality of wheat with the disease resistance and environmental tolerance of rye. The protein content of triticale is higher than that of wheat, although it contains less gluten. Triticale can be used for baking bread.

use **TRITICALE** in

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Breads, Pancakes,  
Crackers



# BARLEY

Barley is perhaps the oldest cultivated grain. It is a member of the grass family and is grouped as either two-row or six-row barley, which refers to the number of rows of grain in each head. Six-row barley contains more protein and is often used as an edible grain. Two-row barley has a lower protein content and thus more fermentable sugar content—it serves as a base malt for beer, scotch, and gin. Like oats, barley is harvested with an indigestible hull. Pearled barley is de-hulled barley that has been steamed to remove the bran and is polished or “pearled”. Barley contains eight essential amino acids and recent studies have shown that eating the whole grain can regulate blood sugar.

use **BARLEY** in

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Beer, Liquor,  
Cook it whole



# CORN

Flint or dent corn is typically used for grinding. (Considered an ancient grain, most people are familiar with flint corn as decorative Indian corn, which you can find at many Greenmarkets and grind yourself). Both flint and dent corn are rock hard inside, store well, contain high amounts of protein, and, while widely used for industrial purposes and animal feed, can also be ground into a variety of products for cooking. Both can be ground very coarse to create polenta, ground finer for grits, even finer for cornmeal, and the finest for corn flour. Freshly ground corn will oxidize and turn rancid and is best used fresh or stored in the freezer. Flint corn is also used to make bourbon.

use **CORN** in

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Polenta, Grits,  
Bourbon, Cornbread



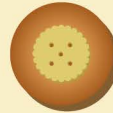
# EINKORN

Domesticated in ancient Mesopotamia in the Fertile Crescent, Einkorn is considered to be one of the “ancient” grains. Einkorn is higher in protein, trace minerals and essential amino acids than any other wheat. The grain may be cooked whole or ground into flour for baking. Einkorn is also safe for some gluten sensitivities.

use **EINKORN** in

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Baking, Pancakes,  
Crackers





## BUCKWHEAT

Buckwheat is used as a hearty cover crop, which can also be harvested for its grain. Buckwheat contains high quality proteins, which include all the amino acids. The seeds are a good source of lycine, B vitamins, magnesium and other vitamins. The whole groats are often toasted and sold as Kasha. Also called a buckwheat seed, a groat is the whole grain (the buckwheat equivalent to a wheat berry). Buckwheat groats need to be hulled before being cooked whole, although one does not need to hull the groat when grinding it for flour. Buckwheat flour can be used to make pancakes, crepes, biscuits, and soba noodles. It is also gluten-free.

use **BUCKWHEAT** in

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Pancakes, Biscuits,  
Soba Noodles, Cook it  
whole (Kasha)



## EMMER (FARRO)

Emmer, termed “farro” in Italy, is an ancient wheat that has been cultivated for over 10,000 years. It is also a very sustainable grain—it grows well without chemical inputs and can better tolerate stressful growing conditions than modern wheat. The emmer grown in New York State comes from Europe by way of North Dakota, where diverse types brought by German immigrants have been grown since the late 19th century. Emmer is known for its distinctive, delicious flavor as a cooked grain. This flavor carries through when it is used to make pasta and flat breads as well.

use **EMMER** in

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Pasta, Flat breads,  
Cook it whole





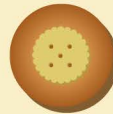
# OATS

All common varieties of oats are harvested with an indigestible hull, so the hull must be removed mechanically to create a food-grade grain. This process can damage the grain and lead to rancidity if it is not treated. Oats which have been mechanically hulled need to be steamed to prevent rancidity, meaning that whole oat groats found in the store are not a living seed. Currently at Greenmarket, whole “live oats” and “Scottish oats” (rough chopped) are available. These oats have not been steamed to preserve them so while they will have a limited shelf life, they contain the full nutritional value and flavor of the whole oat. Once the bran is cracked on the oat, it can go bad within just a few days.

use **OATS** in

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Baking, Cook them whole, Crackers



# RYE

Rye is a cereal grain and should not be confused with rye grass, which is used as a cover crop. Rye grows well in cold climates and has a bold, assertive flavor. Fresh rye should be used soon after it has been milled and stored in the refrigerator. It contains much less gluten than wheat, and is usually blended with wheat when making bread. The grains may also be cooked whole or as cracked rye. Rye is also used to make beer and whiskey.

use **RYE** in

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Breads, Beer, Whiskey



## FREEKEH

Freekeh (pronounced “free-kah”), Farik” in Arabic, is wheat that is harvested green and then roasted. It has been used traditionally in Middle Eastern countries, and is also known as Gruenkern (literally “green grain” in German). It has a characteristic smoked aroma and a toasted, mildly sweet flavor. Freekeh contains more protein, vitamins, and minerals than most grains, and up to four times the fiber content of brown rice, though it has hardly any gluten, since it is harvested before its protein develops. It is used in soups, and stews.

use **FREEKEH** in

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Soups & Stews



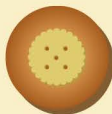
## SPELT

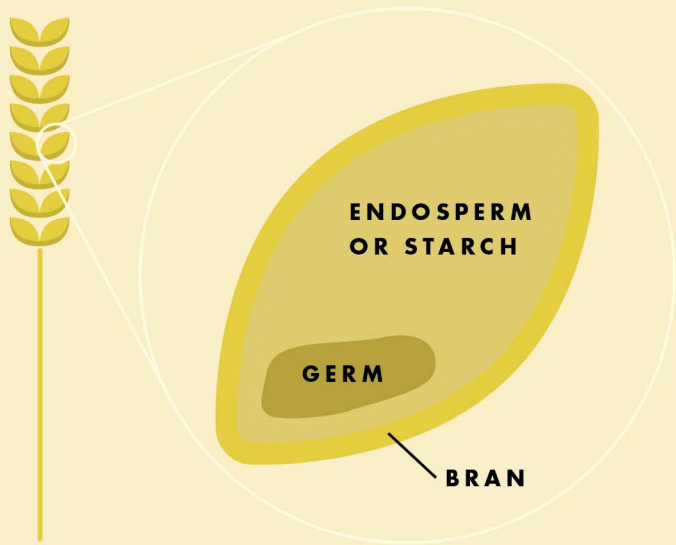
Spelt has a slender rice-like grain and contains less gluten than wheat, but has a higher protein content. Spelt flour can be used for baking breads, crackers, or for making pasta. Spelt berries can be cooked whole. Some people with wheat allergies may be able to tolerate spelt.

use **SPELT** in

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Breads, Crackers, Pasta,  
Cook it whole





## BASIC GRAIN ANATOMY

**BRAN** The outer layer of the wheat grain, the bran makes up 14% of the grain and contains small amounts of protein and large quantities of B vitamins.

**GERM** The embryo of the wheat seed, the germ makes up 2.5% of the grain and contains 10% fat. Because fat will oxidize and turn rancid, the germ is generally removed to make a “shelf stable” flour. The germ, however, contains high quality vitamins and minerals.

**ENDOSPERM OR STARCH** The bulk of the flour, the endosperm (or starch) makes up 83% of the grain and contains the most protein, carbohydrates, iron, B vitamins, and is a source of soluble fiber.



## ADDITIONAL RESOURCES

Alford, Jeffrey & Naomi Duguid, *Flatbreads & Flavors: A Baker's Atlas*. New York: William Morrow and Company, Inc., 1995.

Boyce, Kim, *Good to the Grain: Baking with Whole-Grain Flours*. New York: Stewart, Tabori & Chang, 2010.

Logsdon, Gene, *Small-Scale Grain Raising: An Organic Guide to Growing, Processing, and Using Nutritious Whole Grains for Home Gardeners and Local Farmers*. White River Junction, VT: Chelsea Green Publishing, 2009.

Pitzer, Sara, *Homegrown Whole Grains: Grow, Harvest & Cook Wheat, Barley, Oats, Rice, Corn & More*. North Adams, MA: Storey Publishing, 2009.

Stevens, Daniel, *The River Cottage Bread Handbook*. Berkeley: Ten Speed Press, 2010.

Wing, Daniel & Alan Scott, *The Bread Builders: Hearth Loaves and Masonry Ovens*. White River Junction, VT: Chelsea Green Publishing, 1999.

For over 30 years GrowNYC's Greenmarket staff, volunteers and farmers have been working together to promote regional agriculture, preserve farmland and ensure a continuing supply of fresh, local produce for all New Yorkers. To learn more about GrowNYC's Greenmarket, gardening, recycling and education programs, visit

[WWW.GROWNYC.ORG](http://WWW.GROWNYC.ORG).

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